

Report to the Legislature on the Vermont Clean Energy Development Fund

***Initial proposal to stimulate dialogue and
ensure a transparent public input process***

Submitted by:
Vermont Department of Public Service

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Establishment of the Vermont Clean Energy Development Fund

In 2005, the Vermont General Assembly established the VERMONT CLEAN ENERGY DEVELOPMENT FUND through ACT 74 – AN ACT AUTHORIZING VERMONT YANKEE TO GO BEFORE THE PUBLIC SERVICE BOARD TO SEEK PERMISSION FOR DRY CASK STORAGE. Section 6523 of the ACT specifies that a VERMONT CLEAN ENERGY DEVELOPMENT FUND will be established and funded through proceeds due to the state under the terms of two memoranda of understanding between the Vermont Department of Public Service and Entergy Nuclear VT and Entergy Nuclear Operations, Inc., and by any other monies that may be appropriated to or deposited into the fund.

The purpose of the VERMONT CLEAN ENERGY DEVELOPMENT FUND is to promote the development and deployment of cost-effective and environmentally sustainable electric power resources – primarily with respect to renewable energy resources and the use of combined heat and power technologies - for the long-term benefit of Vermont electric customers. ACT 74 specifies that the FUND shall be managed to promote:

- The increased use of renewably produced electrical thermal energy and combined heat and power technologies in the state;
- The growth of the renewable energy-provider and combined heat and power industries in the state;
- The creation of additional employment opportunities and other economic development benefits in the state through the increased use of renewable energy and combined heat and power technologies;
- The stimulation of increased public and private sector investment in renewable energy and combined heat and power related enterprises, institutions, and projects in the state.

In 2005, the Vermont General Assembly also passed ACT 61 – AN ACT RELATING TO RENEWABLE ENERGY, EFFICIENCY, TRANSMISSION, AND VERMONT'S ENERGY FUTURE. Within the RENEWABLE ENERGY GOALS of ACT 61, the General Assembly found that it is in the interest of the people of the state to promote the state energy policy by:

- Ensuring that to the greatest extent possible the economic benefits of renewable energy in the state flow to the Vermont economy in general and to the rate-paying citizens of the state in particular;
- Supporting development of renewable energy industries in Vermont while retaining and supporting existing renewable energy infrastructure;
- Developing viable markets for renewable energy and energy efficiency projects;
- Protecting and promoting air and water quality by means of renewable energy programs.

Goals of the Vermont Clean Energy Development Fund

In light of the intent of the General Assembly expressed through both ACT 74 and ACT 61, we propose the following goals for the VERMONT CLEAN ENERGY DEVELOPMENT FUND:

1. Accelerate Vermont's investment in electricity resources that are economically sustainable and environmentally sound;
2. Invest in the development and deployment of clean energy technologies to ensure that Vermont maintains an energy supply that is diverse and rich in renewables;
3. Ensure maximum return-on-investment to Vermont ratepayers by funding projects that have the potential to be sustained on a commercial basis.

Guiding Principles of the Vermont Clean Energy Development Fund

To achieve our stated goals, the Fund's guiding principles will be to:

1. Seek to remove unwarranted market barriers related to the development and deployment of renewable energy and combined heat and power technologies in Vermont;
2. Support projects that are most likely to have long-term positive impact for consumers in terms of reliability, cost and environmental attributes;
3. Learn from other states' experiences in establishing and implementing Clean Energy Funds by deliberately seeking to replicate successful practices and avoid known pitfalls.

Organization, Management and Governance

DPS Administration

In accordance with ACT 74, the VERMONT CLEAN ENERGY DEVELOPMENT FUND shall be administered by the Department of Public Service. DPS has extensive experience working with Vermont's ratepayers, power suppliers, and other stakeholders and interested parties. Costs of administration will become clearer as the development of the Fund continues.

In addition to the DPS Fund Administrator, we propose to establish an Advisory Board to provide guidance, advice and support to the Fund administrator

Advisory Board

The role of the Advisory Board would be to assist the Fund Administrator in the development of action plans and in the review of funding proposals, and assist the Fund Administrator in determining the viability of a project, company, product or service; evaluating marketing and business plans; analyzing financial projections; and performing necessary investment structuring.

We propose that the Advisory Board consist of seven members as follows: the DPS Director of Energy Efficiency; a representative of Renewable Energy Vermont; an Investor Owned Utility; a Cooperative Utility; a Municipal Utility; the Vermont State Treasurer or his designee; the Manager of the Vermont Economic Development Authority. Other than those members specifically identified above, we propose that Advisory Board members be appointed by the Governor.

Money Management

We propose that a separate organization such as VEDA be charged with managing the investment portfolio and loan processing of the VERMONT CLEAN ENERGY DEVELOPMENT FUND.

Allocation of Funds from the Vermont Clean Energy Development Fund

Before committing to any expenditure, the Fund Administrator and the Advisory Board will ensure that all potential programs and projects are rigorously evaluated to increase the likelihood that the resources are allocated in a fair and cost-effective manner. To ensure that funding decisions made are consistent with the goals and guiding principles of the VERMONT CLEAN ENERGY DEVELOPMENT FUND, we propose that the following criteria be used when evaluating requests for funding:

Financial Leverage

Not all of the funding for programs and projects should come from the Fund. Rather, the Fund should attempt to maximize its impact by leveraging funding available through the federal government, private investors, companies and consumers. As a result, the degree of financial leverage will be a component of investment decisions.

Sustainability

Programs and projects should be evaluated in terms of the degree to which they are likely to be sustainable over time both in terms of economics and operation.

Market Impact

The Fund should be used to meet the existing demand for renewable energy, reduce barriers to market entry, and to create new markets in Vermont.

Economic Impact

The extent of the additional economic value added created in the state as a result of the development, production, and use of renewable energy resources.

Public Input Process

Renewable Energy Vermont (REV) has agreed to aid in the facilitation of a transparent public input process. Our hope is to obtain feedback to this initial report from as many interested stakeholders as possible, from the 200 business and individual members of REV, to ratepayers, E-23, economic development professionals, other government agencies, etc. This outreach and feedback process will ensure that the ultimate structure and administration of the VERMONT CLEAN ENERGY DEVELOPMENT FUND has the buy-in from all interested parties and stakeholders. This buy-in will be critical to the Fund's success in attaining its stated goals.

Funding Mechanisms

We propose that the VERMONT CLEAN ENERGY DEVELOPMENT FUND use a combination of funding mechanisms to achieve its stated goals:

- **Project Development Incentives:** Financial incentives – such as production incentives and grants – to directly subsidize clean energy project installation;
- **Industry Development Funding Mechanisms:** Business development grants and demonstration projects to build clean energy infrastructure;
- **Research and Development Investment:** Financial support for the development and commercialization of innovative energy and products; technologies, and processes. R&D programs can be instrumental in attracting new business to Vermont, enabling companies to expand, retain and create new jobs.

Proposals for Initial Consideration

While the DPS Administrator and Advisory Board will ultimately determine what initiatives to support through the VERMONT CLEAN ENERGY DEVELOPMENT FUND, the following technologies and initiatives are worthy of initial consideration.

COMBINED HEAT AND POWER (CHP)/DISTRIBUTED GENERATION (DG)

CHP can be an efficient, clean and reliable approach to generating power and thermal energy that provides numerous benefits to energy users, the environment, and the electric grid. In a globally competitive world where our critical employers are facing stiff cost competition, the economic benefit of reducing a facility's fuel and/or electricity costs is important to maintaining our economic prosperity. Better yet, CHP provides a "triple play" benefit of reduced emissions of pollutants and greenhouse gases, enhanced grid reliability, and of course the opportunity to save on electric costs. CHP can decrease the impact of grid power outages and can help reduce congestion on the electric grid by removing or reducing load in areas of high demand. CHP may be used in a variety of applications ranging from small 1 Kilowatt systems, to very large utility-scale applications approaching 1000 Megawatts. We see the up-front capital cost as a barrier to greater CHP deployment in Vermont, as large commercial and industrial customers often have to focus their resources on their core businesses. We must keep in mind that a significant "thermal load" is critical to the underlying economics of CHP projects.

CHP/DG applications have been successfully implemented nationwide in a wide variety of facilities, including:

Industrial Manufacturers – chemical, refining, ethanol, pulp and paper, food processing, glass manufacturing.

Institutions – colleges and universities, hospitals, prisons.

Commercial Buildings – hotels, airports, high-tech campuses, large office buildings, nursing homes.

Municipal – district energy systems, wastewater treatment facilities, landfills, K-12 schools.

Residential – multi-family housing, planned communities

According to the Northeast Combined Heat and Power Initiative, CHP applications fueled by renewable energy resources such as anaerobic digester gas, biomass gas, landfill gas and wood waste, offer 32 GW in economic potential nationally.

Successful CHP/DG applications are currently in place in Vermont. Green Mountain Coffee Roasters and North Country Hospital provide two examples.

Green Mountain Coffee Roasters

Green Mountain Coffee Roasters needed a reliable, on-site, back-up power system for its roasting and packaging operations. The company had been experiencing monthly power disturbances, ranging in duration from less than a second to hours, causing costly downtime in its manufacturing processes and resulting in significant product loss. They looked to Vermont's Northern Power Systems to help find a solution to their need for truly continuous power delivery. Northern Power Systems' solution was to custom-engineer and install a grid-connected, on-site power system. The system has resulted in a reduction of utility power costs during peak use periods, provided highly reliable back up power, and incorporated cost-saving heat recovery for hot water and space heating for Green Mountain Coffee Roasters.

North Country Hospital

North Country Hospital has been receiving both in-state and national attention for its gasifier system that uses wood chips to generate heat and electricity. The wood chips - provided by neighboring Columbia Forest Products - cost the hospital about \$18/ton, with one ton of chips equivalent to 117 gallons of oil. The CHP technology has resulted in huge cost savings for the hospital, anticipated to be as high as \$328,000 annually. If the hospital had not been able to reduce its heating and electrical costs, the costs would have been passed on to patients in the form of an increase in the cost of providing medical care. North Country Hospital believes it is the first hospital in the U.S. to use this type of technology. Hospital officials from Vermont and New York are considering installing similar systems.

BIOMASS

Biomass resources include biomass processing residues from pulp and paper operation, agricultural and forestry wastes, animal wastes, landfill gas, and energy crops grown specifically for energy purposes. Animal waste such as cow manure can be used to generate electricity through methane recovery methods and anaerobic digestion. The biogas that is produced is a renewable resource. In the July 2000 Resource Assessment, the Vermont Farm Methane Project identified cow manure as the category of organic waste that offers Vermont the largest potential source of new energy. In addition, anaerobic digestion is a tool for manure management - particularly important to Vermont's medium-sized farms.

While investment in biomass technologies generally is fundamental to the expansion of renewable energy resources, using the resources of the VERMONT CLEAN ENERGY DEVELOPMENT FUND to stimulate an economically-viable option for farms to invest in anaerobic digester technology seems to address a number of public policy goals for Vermont.

Renewable Energy Generation Systems on Farms

Commercialization of cost-effective anaerobic digester technology addresses more issues than energy generation on farms. Anaerobic digestion also addresses odor control, and can mitigate run-off of pollutants into local waterways, including Lake Champlain and the Connecticut River. Demonstration projects are underway at a number of Vermont farms, including Foster Brothers in Middlebury, Whitcomb Farm in Williston, and perhaps the most widely known – Blue Spruce Farm in Bridport that has been generating electricity from methane for nearly a year for Central Vermont Public Service’s “cow power” program. Around 2,300 CVPS customers choose to pay up to an additional 4 cents per kilowatt hour to support electricity generated by cow power. In addition, the farmers have made an average of more than 11 cents per kilowatt hour for all the energy they have produced since January 2005. However, farmers have not installed anaerobic digesters on a broad basis because they have often required a substantial investment.

Great interest exists in the need to address market barriers to the expansion of anaerobic digestion technologies on Vermont farms. In addition to the Vermont Methane Project, studies have been conducted that have looked at the potential for a central manure digester plant to service dairy farms in the Enosburg Falls area, and the feasibility of a cooperative dairy manure management project in St. Albans. Barriers to expansion of anaerobic digestion include not only the investment in technology, but also lack of access by farms to three phase power lines that are needed for economic, commercial electrical generation.

While Vermont continues to investigate ways to commercialize anaerobic digester technology, other states have invested in studies of their own that are worthy of consideration. The Energy Analysis and Policy Program at the University of Wisconsin in Madison produced a report on “The Economics and Feasibility of Electricity Generation using Manure Digesters on Small and Mid-size Dairy Farms.” In addition, the Minnesota Project has produced a report demonstrating how anaerobic digesters can be used cost-effectively on small farms with as few as 100 cows. Further, the AgSTAR program has produced a report on “Managing Manure with Biogas Recovery Systems: Improved Performance at Competitive Costs.”

There is great demand and opportunity for expansion of anaerobic digester technology in Vermont, not only for renewable energy generation, but also to address manure management requirements of mid-size farms. ACT 61 asks DPS to make recommendations on the feasibility of establishing grant programs for new renewable generation systems on farms. The VERMONT CLEAN ENERGY DEVELOPMENT FUND should be used as a vehicle to commercialize this technology in Vermont, and as a tool to coordinate public policy initiatives and investment by both DPS and the Department of Agriculture.

SOLAR PV

Solar photovoltaics (PV) has significant additional commercial application potential. A recent report issued by the Peregrine Energy Group and the Clean Energy Group takes an innovative look at strategies to foster solar energy and advanced efficiency in affordable multi-family housing. The report highlights the public policy benefits of using clean energy funds to support the use of PV technology, including how incorporating PV technology in affordable multi-family housing can help position the technology as a ready-to-go solution to mitigate rising housing operation costs. The report acknowledges that current PV system economics are often challenging, solar energy today is

the most practical clean energy for use in this housing sector. Solar resources are widely available in the built environment, are delivered at no charge, and can be collected on under-utilized rooftop space. PV is also compatible with other green design features that help control energy costs and improve environmental quality of homes and neighborhoods. Moreover, PV manufacturing and installation costs are predicted to decline over time.

The benefits of PV are not limited to the affordable housing sector. We can envision offering incentives for the placement of solar panels on the tops of commercial buildings to not only provide a clean energy alternative, but to help shave peak demand on the grid during summer months as well.

The solar incentives available through Vermont's existing Solar and Small Wind Incentive Program are fully subscribed. We propose that the VERMONT CLEAN ENERGY DEVELOPMENT FUND be used to replenish this proven program and expand the application of solar PV.

PERFORMANCE-BASED CONTRACTING

With continued focus on rising school budgets and local property taxes, school districts need help in reducing costs wherever they can. Through performance-based contracts, schools (as well as other entities) can reduce their energy costs through energy efficiency improvements, with annual cost savings "guaranteed" by the contractor.

Two years ago the Vermont legislature authorized school districts to enter into energy performance contracting. 16 V.S.A. § 3448f. The purpose of the legislation is to address capital improvements that would save enough money in resulting energy efficiency to pay for the improvements. The Montpelier School District is on the verge of entering into this type of performance-based contract, and serves as a demonstration site for this type of project (Montpelier will be the first school district in Vermont to engage in a this type of energy savings contract, despite the wide spread use of performance contracting nationally).

Despite the obvious positive outcomes associated with performance-based contracting, there is a clear barrier to school districts at the outset: the upfront resources needed for the financial grade audit. The audit provides the details required to build a performance contract with a guarantee by the contractor for specified annual energy savings. If energy savings are not realized each year, the contractor pays the difference. It cost the Montpelier School District \$13,800 for the financial grade energy audit of the three schools in the school system. The contractor was able to identify energy and associated operating savings totaling \$1 million (net after aid) for Montpelier over a ten-year period. Because the technology being used has a 15-year life span, the Montpelier School District will realize an additional \$800,000 in energy and operating savings during years 11-15.

Because of existing demands on school budgets, it is unlikely that a school district will be looking for 'new' ways to expend funds – despite the obvious, guaranteed energy and operating savings that can come with performance-based contracting. As a result, we propose that the VERMONT CLEAN ENERGY DEVELOPMENT FUND be used as a tool to assist schools with the costs of conducting the financial grade energy audit necessary for the performance contract. We would ask the legislature to examine if this is an anticipated use of Fund resources under the definition of

“cost-effective energy efficiency” as stated in ACT 74, and – if necessary – take action to permit this activity.

Next Steps

We present this initial proposal for legislative review. This report represents the first step in the DPS review. We look forward to receiving feedback from the legislature and general public as the process to create and implement the VERMONT CLEAN ENERGY DEVELOPMENT FUND continues.